UTILITY PATENT APPLICATION TRANSMITTAL LETTER (Only for new nonprovisional applications under 37 CFR 1.53(b))	Docket No. USB00 RBA PIC

To the Assistant Commissioner for Patents:

Transmitted herewith for filing is the patent application of:
Patrick RAMBAUD
corresponding to French application 00 00804, filed January 21, 2000,
entitled: METHOD AND SYSTEM FOR MANAGING BATCHES OF IMMUNOCOMPETENT CELLS COLLECTED FROM HUMAN OR ANIMAL SUBJECTS FOR DEFERRED USE, AND RELATED THERAPY METHODS

Enclosed are:

X	14 pages of specification.
X	2 sheets of formal drawings.
X	a newly-executed declaration of the inventor.
	a copy of an executed declaration of the inventor from prior application Serial No. , filed .
	incorporation by reference. The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied as indicated in the preceding box, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.
	an assignment of the invention to , including assignment cover sheet.
	Information Disclosure Statement with Form PTO-1449.
	copies of the Information Disclosure Statement citations.
	preliminary amendment.
X	return receipt postcard (MPEP 503), specifically itemized.
X	applicant claims small entity status under 37 CFR 1.27.
	a certified copy of the Priority Document.
X	other: Data Entry Sheet .

If a CONTINUING APPLICATION, *check appropriate box and supply the requisite information.*

[ ] Continuation [ ] Divisional [ ] Continuation-in-part (CIP)

of prior application No. , filed .

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UTILITY PATENT APPLICATION TRANSMITTAL LETTER (continued)	Docket No. USB00 RBA PIC

CLAIMS AS FILED

	NO. FILED	NO. EXTRA	RATE	FEE
BASIC FEE			$ 710	$ 710
TOTAL CLAIMS	36 - 20 =	16	x$ 18	288
INDEPENDENT CLAIMS	4 - 3 =	1	x$ 80	80
MULTIPLE DEPENDENT CLAIM PRESENT			$ 270	
			TOTAL	$1078
If applicant claims small entity status under 37 CFR 1.27, then divide total fee by 2, and enter amount here.			**SMALL ENTITY TOTAL**	$ 539

X	A check in the amount of $579 to cover the filing fee is enclosed.
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X	Credit any overpayment.
X	Charge any additional fee required under 37 CFR 1.16 and 1.17, during the pendency of this application.
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APPLICATION INFORMATION

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Title Line Two::	OF IMMUNOCOMPETENT CELLS COLLECTED FROM
Title Line Three::	HUMAN OR ANIMAL SUBJECTS FOR DEFERRED
Title Line Four::	USE, AND RELATED THERAPY METHODS
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PRIOR FOREIGN APPLICATION

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"METHOD AND SYSTEM FOR MANAGING BATCHES OF IMMUNOCOMPETENT CELLS COLLECTED FROM HUMAN OR ANIMAL SUBJECTS FOR DEFERRED USE, AND RELATED THERAPY METHODS"

OBJECT OF THE INVENTION

The present invention relates to a method for managing batches of immunocompetent cells, particularly leucocytes, lymphocytes, monocytes, for deferred use. It also concerns a management system for using the method according to the invention, a method and system for determining parameters of a protocol for a deferred use of immunocompetent cells, implemented in the management system according to the invention, and therapy methods wherein said management method can be implemented.

TECHNICAL BACKGROUND

Scientific and clinical works have demonstrated the therapeutic qualities of auto-use of lymphocyte and monocyte derivatives which helps, in particular, to increase cell immunity.

A promising application of this therapeutic method relates to the possibility of strengthening the immunity of a patient at a time in his life when this strengthening proves to be necessary or vital, or to maintain this immunity throughout his life.

However, a significant difficulty to be overcome lies in the availability of immunocompetent cells of a patient over periods of time which could be between several months and several decades. Techniques of cryogenic storage for the future which are widely used in several fields of human and animal biology are already known. In particular, banks have been established for preservation and storage of biological elements.

Document WO8904168 discloses a method for isolating and preserving hematopoïetic cells from fetal and neonatal blood. This method is aimed to a therapeutic use of fetal and neonatal cells for hematopoïetic reconstitution or in gene therapy, and can be implemented for cryopreserving

fetal or neonatal blood cells aimed to autologous reconstitution.

The immunocompetent cells (lymphocytes, phagocyte cells, monocytes, macrophages) play a leading role in the immune system. In particular, lymphocytes store information during life and are the support of memory for humoral and cellular immunity. These immunocompetent cells constitute in fact a library, in particular a lymphocyte library, which is enhanced during life, when the body meets foreign organisms, during viral, parasitic or bacterial infections. By means of this "immunity library", the body can minimize the impact of the infections during life. The action mechanism of the immune system is already known. Information are stored in the walls of lymphocytes, as illustrated by the transfer factor and reported by numerous publications. This mechanism also contributes to the defense against malignant cells.

First, this memory is partially being erased with time, as shown by the requirement to achieve vaccination confirmations for preserving an efficient protection. Concerning the humoral immunity, the antibody ratios decrease, quickly for the IgM, more slowly for the IgG and the IgA.

Moreover, errors are introduced with time and the immunity becomes usually less efficient with years. Because of this degradation, infections as flu are far more dangerous for aged persons. Furthermore, it would be particularly interesting to preserve information acquired along a whole life.

Document WO9953030 discloses a method for managing batches of immunocompetent cells , comprising for a human subject:

- conditioning and storing batches of immunocompetent cells in one or more storage centers,
- constituting and enhancing a personal library of immunocompetent cells from successively collected batches, said personal library preserving a sum of immunity information stored the collected immunocompetent cells, and

in response to a request for treatment of a said human subject:

- processing all or part of said immunity information cumulated in said

personal library, and

- localizing one or more stored batches of immunocompetent cells, and then transferring this or these batch(es) to a requesting cellular-treatment center.

Such a process thus provides patients with the guarantee of storage of their lymphocytes in the long term, with the prospect of having them available at any time for, inter alia, strengthening of their immune system. It therefore becomes possible to give back to people their former immunity and to transmit a cell immunity under rational and reliable management conditions, and also to have access to their corresponding genetic code at the time of collection of the blood.

But besides the need for preserving immunocompetent cells in view of a deferred use, main questions concerning the definition of a suitable protocol for this deferred use are raised. In fact, it was shown that a mere re-injection of immunocompetent cells previously collected on a human subject could result in potentially serious immunity problems. Moreover, it was shown that the quality and potential efficiency of collected immunocompetent cells could be highly dependant on the human subject's general status of health, with adverse consequences for the performance of the present methods.

SUMMARY OF THE INVENTION

The object of the present invention is to remedy these disadvantages by proposing a process for management of batches of immunocompetent cells collected and preserved for deferred use, which fully integrates, for human subjects and extensively for animal subjects, the dimension of identity and status of health.

This object is achieved by a method for management of batches of immunocompetent cells collected from human or animal subjects for deferred use, comprising for each of said human or animal subjects:

- conditioning and preserving successively collected batches of immunocompetent cells, into one or more storage centers, and

- constituting and enhancing from collected batches a personal library of immunocompetent cells, said personal library cumulating a sum of immunity information stored in the collected immunocompetent cells.

According to the invention, the method further comprises:

- gathering information characteristic of the status of said human or animal subject, effected before or during the immunocompetent cells collection, and
- processing said characteristic information for determining parameters of a deferred-use protocol for immunocompetent cells from said human or animal subject's personal library.

With the method according to the invention, information characterizing the human or animal subject's status such as the state of health and psychological status can be processed both for determining the opportunity of collecting immunocompetent cells and for selecting parameters of a deferred-use protocol.

The status-characterizing information are preferably obtained by processing a blood sample collected from the human or animal subject. They may comprise bioelectronic information resulting from processing respective measures of pH, oxidation-reduction potential Rh2 and resistivity of blood previously collected on said human or animal subject according to the Vincent's bioelectronic method.

The status-characterizing information may also comprise information obtained by processing sensible crystallization images of blood previously collected on said human or animal subject, and/or information obtained from a capillary study on elements of said human or animal subject's hair.

The status-characterizing information and the immunity information stored in the immunocompetent cells of said human or animal subjects are advantageously entered into an expert system used for determining parameters for deferred-use protocols. This expert system can be arranged for providing an interpretation of said status-characterizing information and said immunity information with respect to a particular gene.

The process of the status-characterizing information is arranged for determining respective optimal proportions of different immunocompetent cells in view of their deferred use, and, for example, can provide with a determination of an optimal ratio between lymphocytes T4 and T8 in view of their deferred use.

When the method according to the invention is implemented in a therapeutic protocol including re-injecting lymphocytes on a human or animal subject, the previously collected and preserved immunocompetent cells can be submitted to an ex-vivo process before being re-injected. The method according to the invention can also be implemented in a therapeutic protocol including re-injecting lymphocytes T with a specific cytotoxic activity after ex-vivo expansion, or in a gene therapy protocol.

The therapy protocol wherein the management method according to the invention is implemented generally includes a step for checking the harmlessness of lymphocytes before réinjection. This checking step comprises a test of the oxidative stress of the lymphocytes before réinjection, during which said lymphocytes are aggressed by free radicals. In an evolutionary test for a period of roughly 3 to 6 months, ill-stored lymphocytes when submitted to free radicals generate a quantifiable oxidative stress.

The oxidative stress test can also advantageously used to check various therapy ways for an ex vivo processing and their matching with the human or animal subject concerned by said therapy. Thus, an excessively aggressive lymphocyte product will produce a great amount of free radicals. In the case of an ex vivo processing including a cytotoxic processing, this test enables to choose the most adequate therapy for a patient.

Another promising way of implementation for the management method according to the invention relates to therapy protocols including an ex vivo processing between lymphocytes and a vaccine before réinjection. No production of antibodies has been observed.

The management method according to the invention can further be implemented in a therapy protocol including an ex vivo processing for an

allergic desensitization of lymphocytes before réinjection. The product obtained from said protocol is then mixed with lymphocytes stored before réinjection.

In another implementation of the management method according to the invention, the related therapy protocol includes re-injecting lymphocytes into a patient's body by the lymphatic way. The aim is reduce the prescribed quantities in view of a better tolerance by said patient and a greater reaction speed.

The management method according to the invention can also be implemented in a therapy protocol for transfusing blood from a donor to a receiver, said protocol including substituting lymphocytes from the donor by lymphocytes from the receiver.

The management method according to the invention can further comprise, before the step of cryo-preservation of a batch of immunocompetent cells, an initial step for cryogenizing said batch arranged for causing the antibodies initially present in said batch to be annihilated. A step for checking the annihilation of other antibodies within the batch of immunocompetent cells can also be provided.

In a particular embodiment of the method according to the invention, said method further comprises, during a sequence for conditioning a batch of immunocompetent cells previously sampled, a step of immunomagnetic selection for purified lymphocytes or monocytes.

According to another aspect of the invention, there is proposed a system for managing batches of immunocompetent cells collected from human or animal subjects for their deferred use, implementing the method according to any of preceding claims, said system comprising for each of said human or animal subjects:

- means for conditioning and preserving batches of immunocompetent cells successively collected, into one or more storage centers, and
- means for constituting and enhancing from said collected batches a personal library of immunocompetent cells, said personal library

cumulating a sum of immunity information stored in the collected immunocompetent cells.

According to the invention, the system comprises:

- means for gathering information that are characteristic of said human or animal subject's status, before or during immunocompetent cells collection, and
- means for processing said status-characterizing information in view of determining parameters for a deferred-use of immunocompetent cells from said human or animal subject's personal library.

According to still another aspect of the invention, there is proposed a therapy method comprising the step of re-injecting immunocompetent cells in the body of a human or animal subject, said immunocompetent cells having been previously collected during one or more collecting steps from said human or animal subject, and then conditioned, preserved and stored, and constituting a personal library cumulating a sum of immunity information stored in said collected immunocompetent cells.

Said therapy method is characterized in that it is controlled by a deferred-use protocol for said immunocompetent cells which includes parameters obtained by processing immunity information stored in said immunocompetent cells and information characteristic of the status of said human or animal subject, said characteristic information having been gathered before or during the one or more collecting steps.

In a therapy protocol including re-injecting lymphocytes on a human or animal subject, the previously collected and preserved immunocompetent cells are submitted to an ex-vivo process before being re-injected.

The therapy protocol can include re-injecting lymphocytes T with a specific cytotoxic activity after ex-vivo expansion.

According to still another aspect of the invention, there is proposed a method for determining parameters of a protocol for a deferred use of immunocompetent cells from a human or animal subject's personal library, said personal library cumulating a sum of immunity information stored in the

immunocompetent cells successively collected and conditioned under the form of batches preserved in one or more storage centers, characterized in that said method comprises:

- measuring physical and/or biological characteristics done on samples of fluid and/or hair from said human or animal subject before or during the collection of immunocompetent cells,
- collecting information characteristic of said human or animal subject's status resulting from said measurements,
- processing said characteristic information in an information system for determining parameters of said deferred-use protocol, and
- storing said processed information in a cell management data base.

There is also proposed a system for determining parameters of a protocol for a deferred use of immunocompetent cells from a human or animal subject's personal library, said personal library cumulating a sum of immunity information stored in the immunocompetent cells successively collected and conditioned under the form of batches preserved in one or more storage centers, characterized in that said system comprises:

- means for measuring physical and/or biological characteristics done on samples of fluid and/or hair from said human or animal subject before or during the collection of immunocompetent cells,
- means for collecting information characteristic of said human or animal subject's status resulting from said measurements,
- means for processing said characteristic information in an information system to determine parameters of said deferred-use protocol, and

means for storing said processed information in a cell management data base.

DETAILED DESCRIPTION

Other details and advantages of the invention will also become apparent in the description below. Regarding the attached drawings, given as non-limiting examples:

- Figure 1 is a block diagram of the management method according to the invention; and
- Figure 2 is a time-diagram featuring main steps of the management method according to the invention effected for a human or animal subject.

The management method according to the method generally includes, with reference to Figure 1 a first stage of characterization and identification of the human or animal subject's status, successive stages of collection of immunocompetent cells from said subject followed by stages of cryo-preservation and storage of batches of cells, and by one or more stages of deferred use of preserved cells

During the characterization and identification stage, samples of blood and of other fluids and secretions like saliva or urine are collected from the human or animal subject. Samples of hair can also be collected. The blood sample can be processed by any suitable biologic method for providing information characterizing the effective identity.

For example, the Vincent's bioelectronic method, that includes a measurement of the pH, a measurement of the oxidation-reduction potential rH2, and a measurement of the resistivity ρ of the blood sample, provides an interesting characterization of the subject's present status of health.

Another useful biologic evaluation method consists in the processing and interpretation of sensible crystallization images of blood, and provides with other status-characterizing information concerning the subject's status of health with precise data on various physiologic troubles.

Status-characterizing information provides by either a bioelectronic process or a sensible crystallization image process, can be corroborated by information processed from a capillarity study on a hair sample.

The whole status-characterizing information are gathered and processed to generate identity data that can be entered into an expert system for which specific rules are implemented.

Following the above-described characterization and identification

stage, a collection stage is effected provided that identity data meet physiologic requirements for allowing said collection stage. Blood is collected and separated to get various component cells such as lymphocytes and monocytes. The various cells obtained by separation are identified, prepared and if necessary processed and fractionated in a plurality of n batches. These n batches of immunocompetent cells are then conditioned, cryo-processed and stored into various storage sites 1,...,i,...,n located for ensuring the best integrity and safety for said batches of cells.

It has to be noted that a method of immunomagnetic selection for the purified lymphocytes and monocytes can be used. Furthermore, cryo-protectors can advantageously be used during the cryo-preservation of the immunocompetent cells.

The immunocompetent cells are preferably preserved at a temperature comprised between –80°C and –120°C. Preservation in liquid nitrogen at –196°C often raises problems of infrastructure and logistic.

The deferred use of lymphocytes can raise problems if antibodies are preserved because, along the time, the concerned subject or patient may be submitted to a reaction against his or its own antibodies and to a reject of said antibodies. An initial step of cryogenization can be provides in order to annihilate antibodies within a batch of immunocompetent cells. Before reusing this batch of cells, a step for checking the effective annihilation of said antibodies.

It is important to ensure the structural and functional integrity of the cryo-preserved cells, in order to guarantee their reliability in view of a deferred use.

The batches of immunocompetent cells or haematopoietic system components can thus be stored over widely varying periods, which can range from a few days to several decades, provided that proper storage of the haematopoietic-system components in the long term is guaranteed. Furthermore, the principle of not storing all the batches of one patient at the same site contributes substantially to the security of the supply.

All along these processing sequences, data related to every elementary step are collected, gathered and stored into a cell management database that also receives data from the expert system including the subject's identity data. The stored immunocompetent cells belonging to a human or animal subject constitute his or its personal immunity library that is linked by the cell management database that can be located within a management center controlling the plurality of storage sites and one or more preparation and cryo-preservation centers.

When the management center receives a request for re-use to the benefit of a human or animal subject, an identification of the personal batches of cells is effected by consulting (R) the cell management database and receiving (D) from said database identification data related to an appropriate batch of cells which is forwarded from a storage site towards a center specifically equipped for deferred re-use.

By interrogation of the database, a batch belonging to this subject is determined and located in one of the storage sites. After location and cell identification, the batch in question is forwarded by express transport to a cell treatment center which can also be the center in which the initial collection was made.

Said batch is the processed to room temperature and immunocompetent cells are put in culture and/or submitted to an ex-vivo process. Parameters of a protocol of re-use are determined by requesting identity data from the cell management database and processing said identity data to determine for example optimal ratio between lymphocytes T4 and T8 for re-injection. Said re-use or deferred-use protocol is then implemented in a re-use process applied to the human or animal subject.

The management method according to the invention allows the constitution all along a human or animal subject's life of both a personal "cell library" and of a personal database containing data resulting from successive characterization stages and data generated by use of the expert system, as illustrated by Figure 2. As a way of example, at an instant To, a human or

animal subject is submitted to a status characterization process SCo that provides with information characterizing the subject's physiologic identity and state of health. If this characterization stage results in a correct evaluation, a stage for collecting immunocompetent cells is then effected at instant Tco on the human or animal subject.

At a further instant Tj, another status-characterization stage is effected on the human or animal subject and this characterization stage results in data revealing a physiologic trouble preventing from any cell collection. A therapeutic treatment can be proposed in order to remedy the diagnosed trouble and another characterization stage is further effected at instant Tn until getting a correct evaluation allowing a collection stage i of immunocompetent cells.

Data resulting from the successive status-characterization stage are gathered, processed in the expert system and stored in cell management database, while collected immunocompetent cells enhance the subject's personal cell library.

When a re-use process of immunocompetent cells is prescribed for a human or animal subject, a protocol of deferred-use is determined using data stored in the database with, for example, optimal proportions between each type of cells. Selected immunocompetent cells are then extracted from the personal cell library and, if necessary, processed ex-vivo. When these immunocompetent cells are ready for use, an re-use process according to the determined personal protocol is effected at instant Tu.

It should be noted that each patient or subject following such a program generally has available a stock of batches of immunocompetent cells or haematopoietic-system components, which enables him, for example, to spread successive auto-uses, for example in the form of auto-injections, over a period of time, with the aims of strengthening the immune system or gene or other therapy, or also to use them massively if the stock of haematopoietic-system components made up in this way is required.

The management method according to the invention is preferably

implemented in the form of a software installed on management and data processing systems, which may be located in batch management centers and be connected to all the data processing sites located within the cytopheresis, express logistics and storage centers.

It has to be noted that a management system according to the invention can be entirely automated, from the collection of information characteristic of the physical and/or biological status of a subject, through the preservation and storage of immunocompetent cells, up to the determination of protocols for deferred-use of said immunocompetent cells. The protocol determination process can be advantageously implemented in an expert system processing past experimental and clinical data related to deferred-use cumulated practice. For example, a deferred-use protocol may comprise as a way of non-limitative example, an optimal time schedule indicating the proposed dates for deferred use depending on collected personal parameters and therapeutic indications for re-use, and biological and technical indications required for cell processing before re-use.

In a management system according to the invention, a personal library cumulating a sum of immunity information stored in the collected immunocompetent cells, can be managed for each human or animal subject. Personal characteristic Information collected during the biological and physical analysis sequences can be stored, either close to the corresponding personal immunocompetent cells, for example in an electronic chip or microcircuit within or close to the preservation devices, or in global storage units remote from the cell storage and preservation units and accessible through communication networks. Hybrid and redundant solutions combining close storage of both immunocompetent cells and related information and remote information storage can also be provided.

Besides the numerous applications contemplated in the field of human therapy, the method according to the invention can also be implemented in the field of mass animal production, particularly as an alternative to the antibiotic therapy, for racehorses in order to provide them with an immunity

protection, and for pet animals as an anti-aging factor and for its action on the immunity system.

The invention is of course not limited to the examples which have just been described, and several modifications may be made to these examples without going beyond the context of the invention. In the context of the collection and re-use phases, additional technical stages can thus be provided, according to medical requirements and safety constraints. The tools of communication used between the various operational and management centers can be of any nature.

Furthermore, the data gathered in the context of the management process according to the invention may advantageously be processed for statistical purposes, with applications in the field of prevention and insurance.

CLAIMS

1. A method for managing batches of immunocompetent cells collected from human or animal subjects for deferred use, comprising for each of said human or animal subjects:

- conditioning and preserving successively collected batches of immunocompetent cells, into one or more storage centers, and
- constituting and enhancing from collected batches a personal library of immunocompetent cells, said personal library cumulating a sum of immunity information stored in the collected immunocompetent cells,

characterized in that it further comprises:

- gathering information characteristic of the status of said human or animal subject, effected before or during the immunocompetent cells collection, and
- processing said characteristic information for determining parameters of a deferred-use protocol for immunocompetent cells from said human or animal subject's personal library.

2. The method according to claim 1, characterized in that the status-characterizing information are obtained by processing a blood sample collected from the human or animal subject.

3. The method according to claim 2, characterized in that the status-characterizing information comprise bioelectronic information resulting from processing respective measures of pH, oxidation-reduction potential Rh2 and resistivity ρ of blood previously collected on said human or animal subject (Vincent's bioelectronic method).

4. The method according to claim 1, characterized in that status-characterizing information comprise information obtained by processing

sensible crystallization images of blood previously collected on said human or animal subject.

5. The method according to claim 1, characterized in that the status-characterizing information comprise information obtained from a capillarity study on elements of said human or animal subject's hair system.

6. The method according to claim 1, characterized in that the status-characterizing information and the immunity information stored in the immunocompetent cells of said human or animal subjects are entered into an expert system used for determining parameters for deferred-use protocols.

7. The method according to claim 6, characterized in that said expert system is arranged for providing an interpretation of said status-characterizing information and said immunity information with respect to a particular gene.

8. The method according to claim 1, characterized in that the status-characterizing information processing is arranged for determining respective optimal proportions of different immunocompetent cells in view of their deferred use.

9. The method according to claim 8, characterized in that the status-characterizing information processing provides with a determination of an optimal ratio between lymphocytes T4 and T8 in view of their deferred use.

10. The method according to claim 1, implemented in a therapeutic protocol including re-injecting lymphocytes on a human or animal subject, characterized in that the previously collected and preserved immunocompetent cells are submitted to an ex-vivo process before being re-injected.

11. The method according to claim 10, implemented in a therapeutic protocol including re-injecting lymphocytes T with a specific cytotoxic activity after ex-vivo expansion.

12. The method according to claim 10, implemented in a therapy protocol including a step for checking the harmlessness of the lymphocytes before re-injection.

13. The method according to claim 12, implemented in a therapy protocol including a checking step comprising a test of the oxidative stress of the lymphocytes before réinjection, wherein said lymphocytes are aggressed by free radicals.

14. The method according to claim 13, implemented in a therapy protocol including a oxidative stress test for checking various therapy ways for an ex vivo processing and suitability of said therapy ways with the concerned human or animal subject.

15. The method according to claim 10, implemented in a therapy protocol including an ex vivo processing between lymphocytes and a vaccine before re-injection.

16. The method according to claim 10, implemented in a therapy protocol including an ex vivo processing for an allergic desensitization of the lymphocytes before re-injection.

17. The method according to claim 10, implemented in a therapy protocol including a step for re-injecting lymphocytes by the lymphatic way.

18. The method according to claim 10, implemented in a therapy protocol for transfusing blood from a donor to a receiver, said protocol including

substituting lymphocytes from said donor by lymphocytes from said receiver.

19. The method according to claim 1, implemented in a gene therapy protocol.

20. The method according to claim 1, characterized in that it further comprises, before the step for cryo-preserving a batch of immunocompetent cells, an initial step for cryogenizing said batch in view of annihilating antibodies present within said batch.

21. The method according to claim 20, characterized in that it further comprises, before any re-use of a batch of immunocompetent cells previously collected, a step for checking the annihilation of the antibodies within said batch.

22. The method according to claim 1, characterized in that it further comprises, during a sequence for conditioning a batch of immunocompetent cells previously collected, a step for immunomagnetically selecting purified lymphocytes or monocytes.

23. A system for managing batches of immunocompetent cells collected from human or animal subjects for their deferred use, implementing the method according to claim 1, said system comprising for each of said human or animal subjects:

- means for conditioning and preserving batches of immunocompetent cells successively collected, into one or more storage centers, and
- means for constituting and enhancing from said collected batches a personal library of immunocompetent cells, said personal library cumulating a sum of immunity information stored in the collected immunocompetent cells,

characterized in that it further comprises:

- means for gathering information that are characteristic of said human or animal subject's status, before or during immunocompetent cells collection, and
- means for processing said status-characterizing information in view of determining parameters for a deferred-use of immunocompetent cells from said human or animal subject's personal library.

24. The system according to claim 23, characterized in that it further comprises means for getting status-characterizing by processing a blood sample collected on said human or animal subject.

25. The system according to claim 24, characterized in that it further comprises means for getting bio-electronic information by processing respective measures of the pH, the oxidation-reduction potential and the resistivity of blood previously collected on said human or animal subject.

26. The system according to claim 23, characterized in that it further comprises means for getting information by processing sensible crystallization images of blood previously collected on said human or animal subject.

27. The system according to claim 23, characterized in that it further comprises means for getting information from a capillary study on elements of said human or animal subject's hair system.

28. The system according to claim 23, characterized in that it further comprises means for controlling and enhancing an expert system from information characteristic of the status of human or animal subjects and from immunity information stored in said human or animal subject's immunocompetent cells, in view of determining parameters for deferred-use protocols.

29. the system according to claim 28, characterized in that it further comprises means for providing an interpretation of said human or animal subject's status-characterizing information and said immunity information, with respect of a particular gene.

30. The system according to claim 23, characterized in that it further comprises means for providing, from status-characterizing information, a determination of respective optimal proportions for different immunocompetent cells in view of their deferred use.

31. The system according to claim 30, characterized in that the determination means comprise means for determining an optimal ration between lymphocytes T4 and T8 in view of their deferred use.

32. A therapy method comprising a step of re-injecting immunocompetent cells in the body of a human or animal subject, said immunocompetent cells having been previously collected during one or more collecting steps from said human or animal subject, and then conditioned, preserved and stored, and constituting a personal library cumulating a sum of immunity information stored in said collected immunocompetent cells, characterized in that it is controlled by a deferred-use protocol for said immunocompetent cells which includes parameters obtained by processing immunity information stored in said immunocompetent cells and information characteristic of the status of said human or animal subject, said characteristic information having been gathered before or during the one or more collecting steps.

33. The therapy method according to claim 32, including re-injecting lymphocytes on a human or animal subject, wherein the previously collected and preserved immunocompetent cells are submitted to an ex-vivo process before being re-injected.

34. The therapy method of claim 33, wherein lymphocytes T with a specific cytotoxic activity are re-injected after ex-vivo expansion.

35. A method for determining parameters of a protocol for a deferred use of immunocompetent cells from a human or animal subject's personal library, said personal library cumulating a sum of immunity information stored in the immunocompetent cells successively collected and conditioned under the form of batches preserved in one or more storage centers, characterized in that said method comprises:

- measuring physical and/or biological characteristics done on samples of fluid and/or hair from said human or animal subject before or during the collection of immunocompetent cells,
- collecting information characteristic of said human or animal subject's status resulting from said measurements,
- processing said characteristic information in an information system for determining parameters of said deferred-use protocol, and
- storing said processed information in a cell management data base.

36. A system for determining parameters of a protocol for a deferred use of immunocompetent cells from a human or animal subject's personal library, said personal library cumulating a sum of immunity information stored in the immunocompetent cells successively collected and conditioned under the form of batches preserved in one or more storage centers, characterized in that said system comprises:

- means for measuring physical and/or biological characteristics done on samples of fluid and/or hair from said human or animal subject before or during the collection of immunocompetent cells,
- means for collecting information characteristic of said human or animal subject's status resulting from said measurements,

- means for processing said characteristic information in an information system to determine parameters of said deferred-use protocol, and
- means for storing said processed information in a cell management data base.

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ABSTRACT

"METHOD AND SYSTEM FOR MANAGING BATCHES OF IMMUNOCOMPETENT CELLS COLLECTED FROM HUMAN OR ANIMAL SUBJECTS FOR DEFERRED USE, AND RELATED THERAPY METHODS"

A method for managing batches of immunocompetent cells collected from human or animal subjects for deferred use, comprising for each of said human or animal subjects:

- conditioning and preserving successively collected batches of immunocompetent cells, into one or more storage centers, and
- constituting and enhancing from collected batches a personal library of immunocompetent cells, said personal library cumulating a sum of immunity information stored in the collected immunocompetent cells,

This method further comprises:

- gathering information characteristic of the status of said human or animal subject, effected before or during the immunocompetent cells collection, and
- processing said characteristic information for determining parameters of a deferred-use protocol for immunocompetent cells from said human or animal subject's personal library.

See figure 1

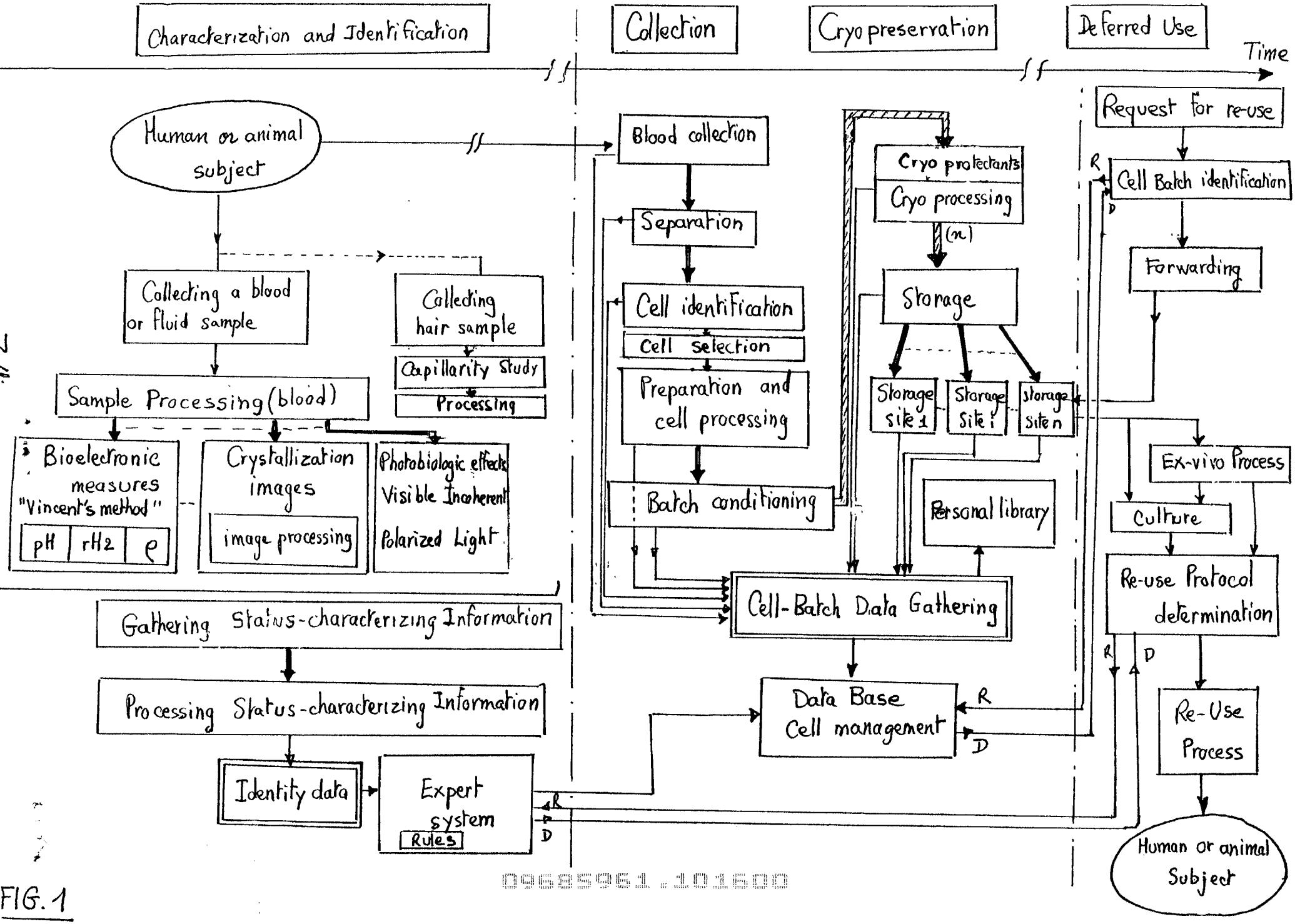

FIG. 1

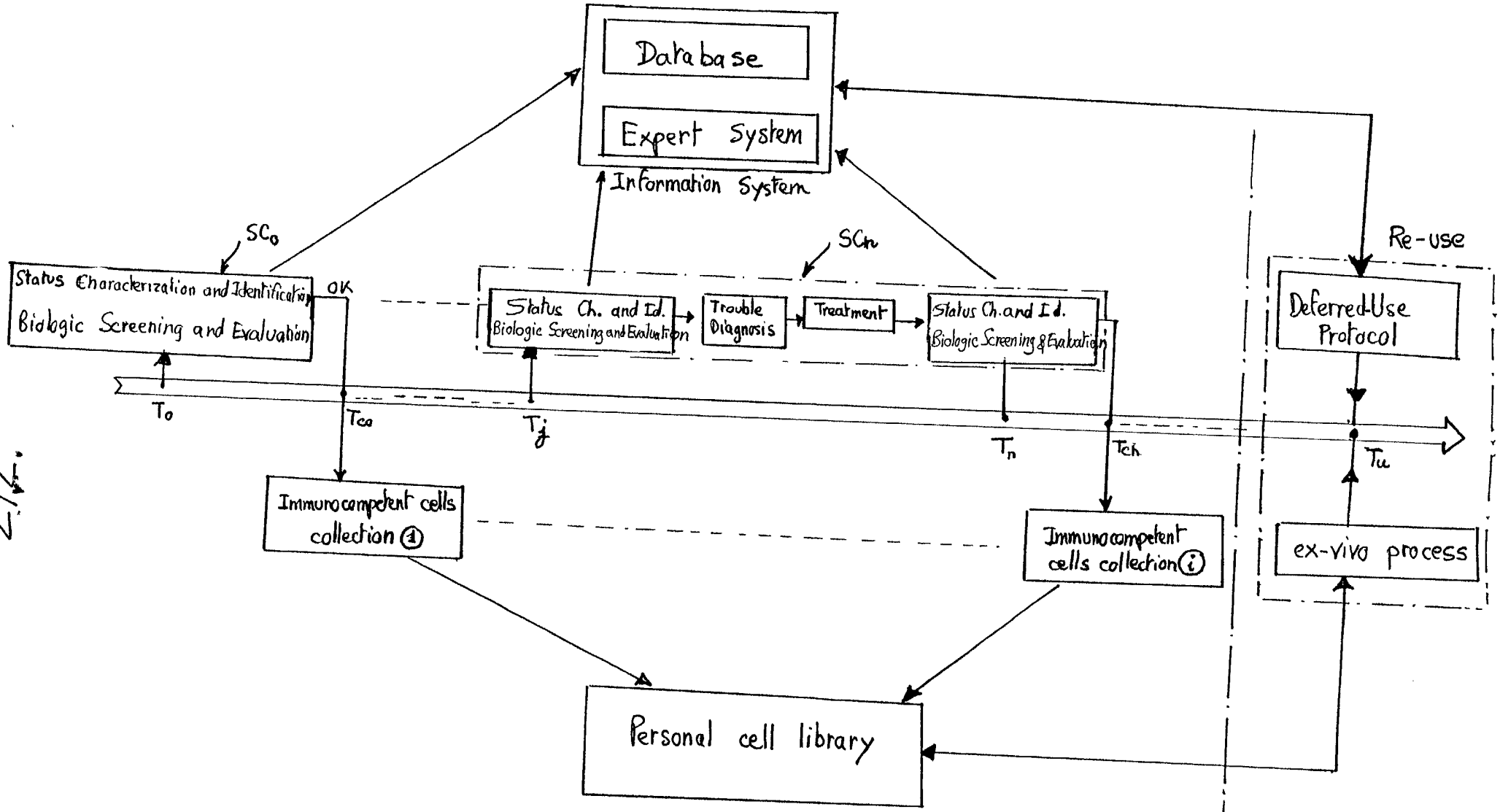

FIG. 2

Ref. _____

COMBINED DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Method and system for managing batches of immunocompetent cells collected from human or animal subjects for deferred use, and related therapy methods.

the specification of which: *(check one)*

REGULAR OR DESIGN APPLICATION

[x] is attached hereto.

[ ] was filed on _____ as application Serial No. _____ and was amended on _____ (if applicable).

PCT FILED APPLICATION ENTERING NATIONAL STAGE

[ ] was described and claimed in International application No. _____ filed on _____ and as amended on _____ (if any).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

PRIORITY CLAIM

I hereby claim foreign priority benefits under 35 USC 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

PRIOR FOREIGN APPLICATION(S)

Country	Application Number	Date of Filing (day, month, year)	Priority Claimed
FRANCE	00 00804	21/01/2000	YES

(Complete this part only if this is a continuing application.)

I hereby claim the benefit under 35 USC 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of 35 USC 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37 Code of Federal Regulations §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.) (Filing Date) (Status--patented, pending, abandoned)

POWER OF ATTORNEY

The undersigned hereby authorizes the U.S. attorney or agent named herein to accept and follow instructions from Pontet Allano & Ass. as to any action to be taken in the Patent and Trademark Office regarding this application without direct communication between the U.S. attorney or agent and the undersigned. In the event of a change in the persons from whom instructions may be taken, the U.S. attorney or agent named herein will be so notified by the undersigned.

As a named inventor, I hereby appoint the following attorney(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: **Robert J. PATCH, Reg. No. 17,355, Andrew J. PATCH, Reg. No. 32,925, Robert F. HARGEST, Reg. No. 25,590, Benoît CASTEL, Reg. No. 35,041, Eric JENSEN, Reg. No. 37,855, and Thomas W. PERKINS, Reg. No. 33,027**, c/o YOUNG & THOMPSON, Second Floor, 745 South 23rd Street, Arlington, Virginia 22202.

Address all telephone calls to Young & Thompson at 703/521-2297.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Inventor's signature _____ Date _____

Residence: Citizenship:

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(given name, family name)

Inventor's signature _____ Date _____

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Post Office Address:

Form Y&T (2/97)

TOTAL PAGE(S) 02